In-House App Development for iPhone

Session 603

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In-House App Development for iPhone

Steve Cotterill
User Experience Engineer
Apple IS&T

Jake Logan
Sr. Software Engineer
Apple IS&T

I’m IT, You’re IT

- We work in IT@Apple
- We are facing the same problems you are
- We understand the difficulties of delivering

You are here

Brave New World

- Alien territory
  - Limited power, smaller keyboard, single-user system
- More variables
  - Dynamic location and network connection
- Time passes slowly
  - When your surroundings are dynamic, you feel every millisecond

Great Expectations

- Availability
  - Whenever, wherever
- Reliability
  - Trustworthy, backed up, without having to be more careful
- Security
  - Totally secure, without the pain of authentication

The Bionic Man

Better, stronger, faster

- One million answers in your pocket
- Always connected and informed
- Global reach

Don’t think of your iPhone apps as *miniversions* of your desktop apps

Think of them as safe and legal

performance enhancers

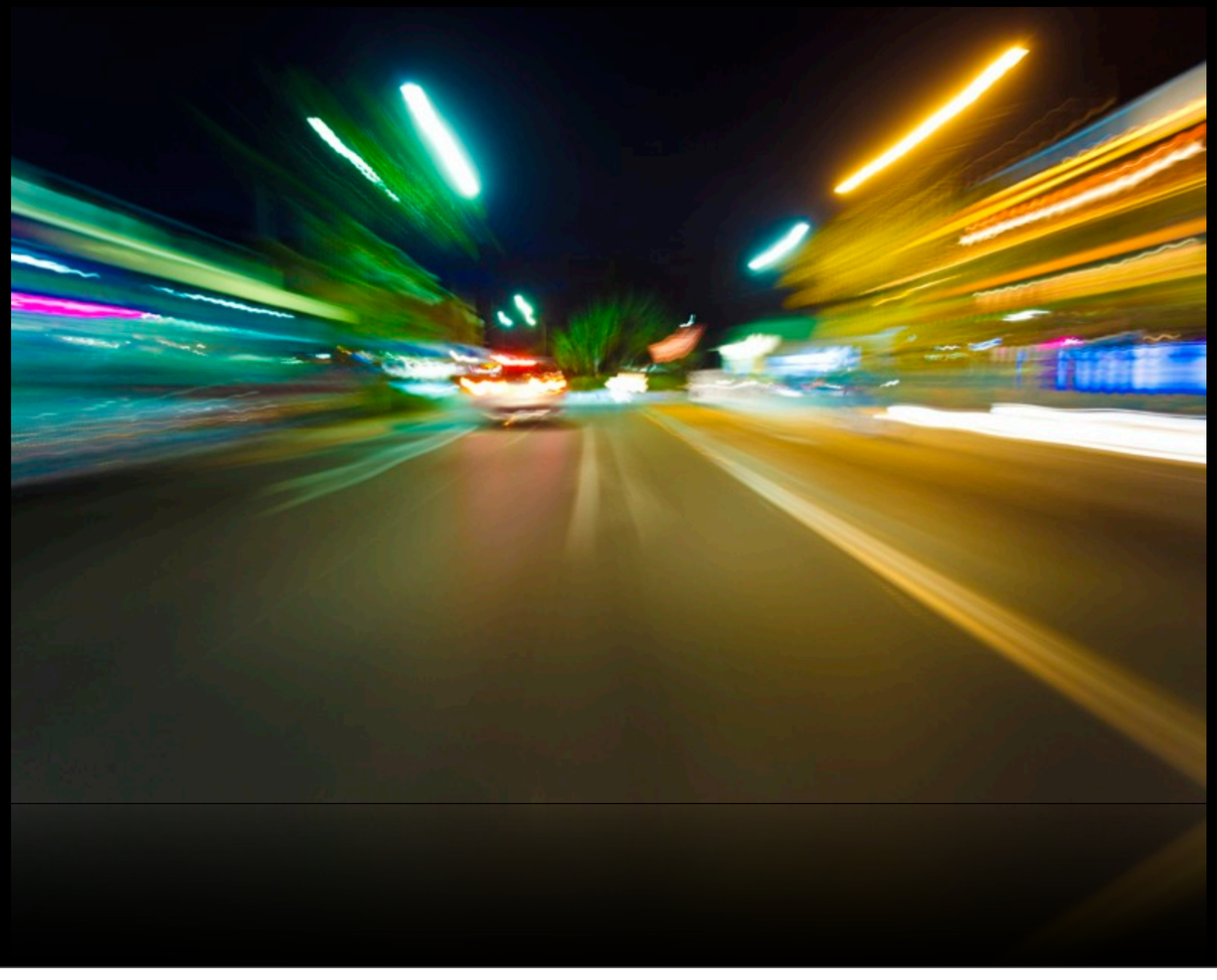
for your users

This statement has not been evaluated by the FDA

7 Habits of Highly Effective Applications

7 Habits of Highly Effective Applications

- Fast



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- Fast
- Familiar

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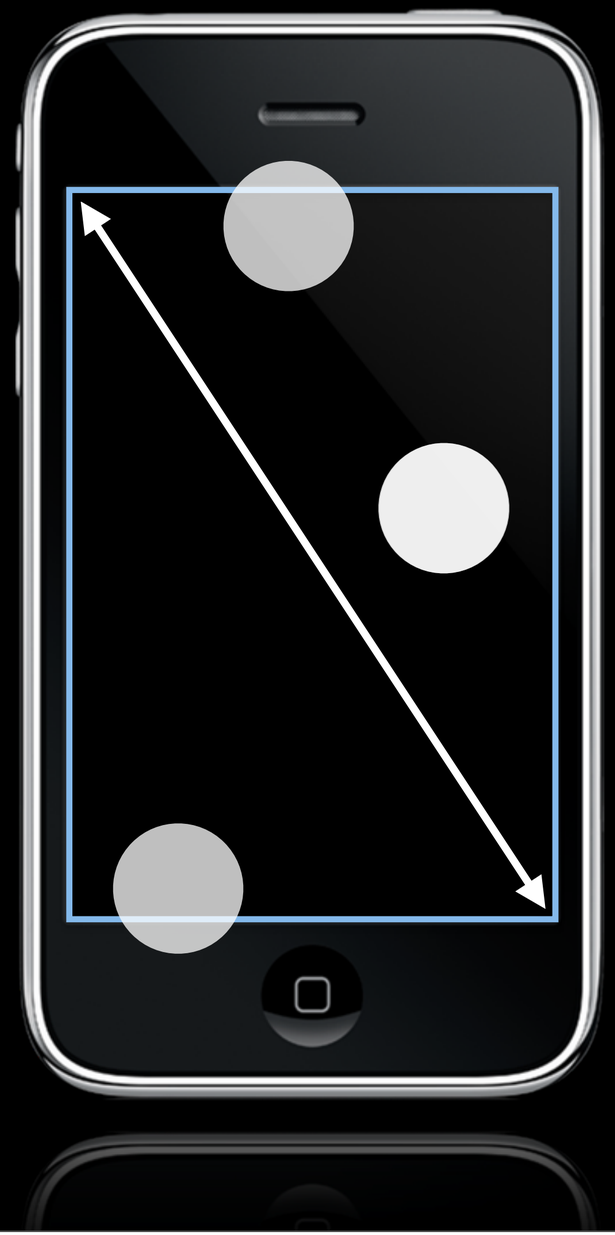

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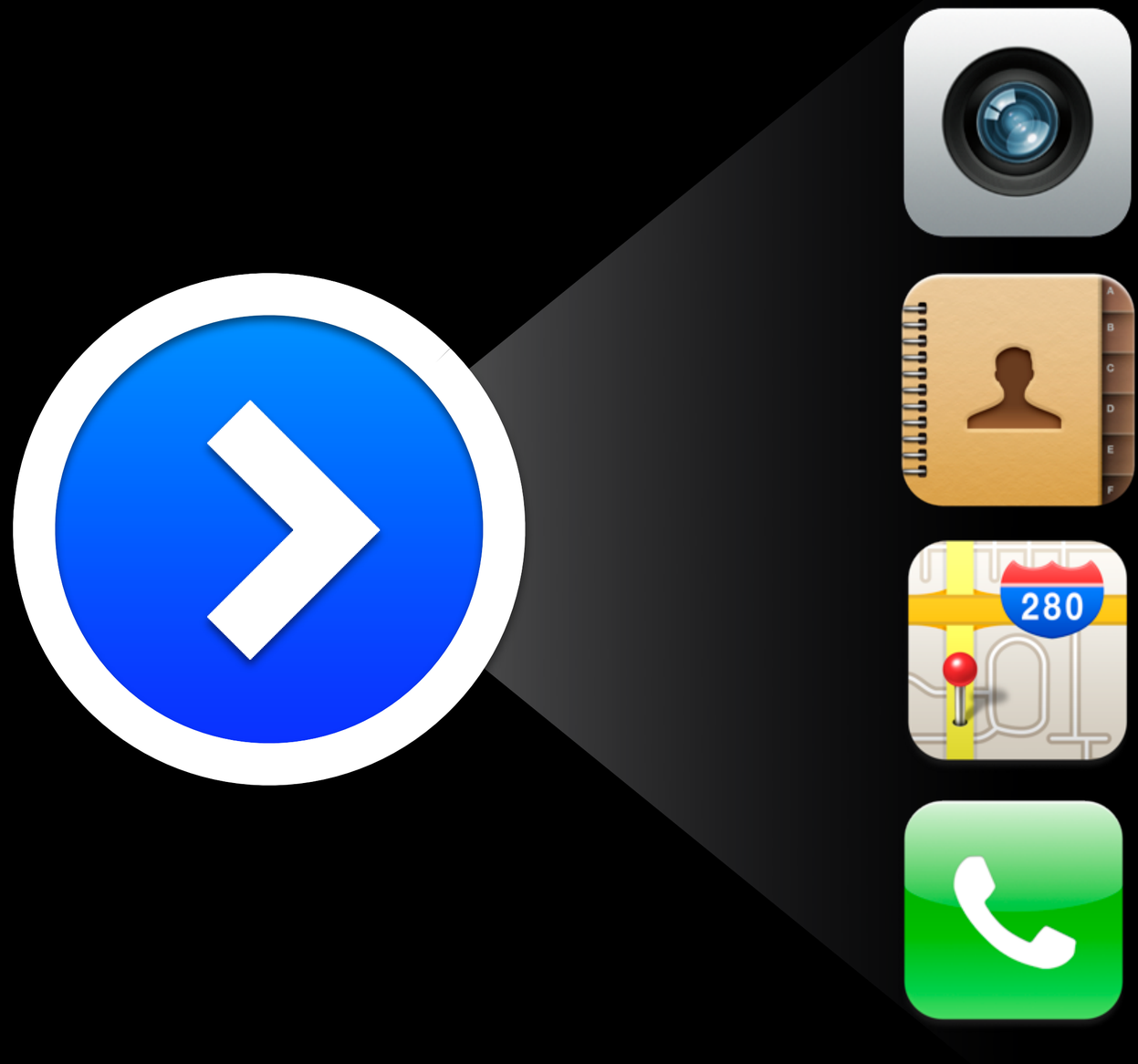
- Foresight



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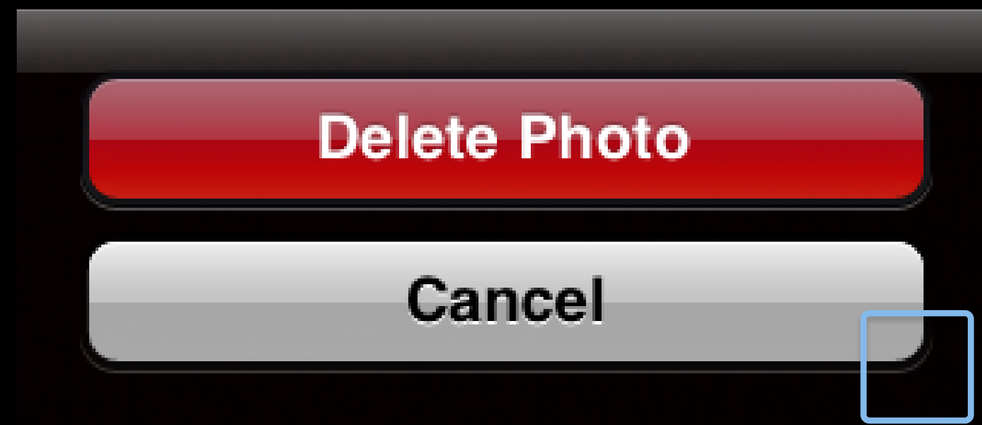

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- Focused
- Foresight
- Forgiving
- Fun!

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BAD

GRAPHICS

A Tale of 2 Platforms

Phone, Mail, Maps		
App Icon		
Instant Deployment		
Multi-Touch		
Graphics/Animation		
Local Persistence		
Available Offline		
Location Services		
Accelerometer		
Camera		
Push Notification		

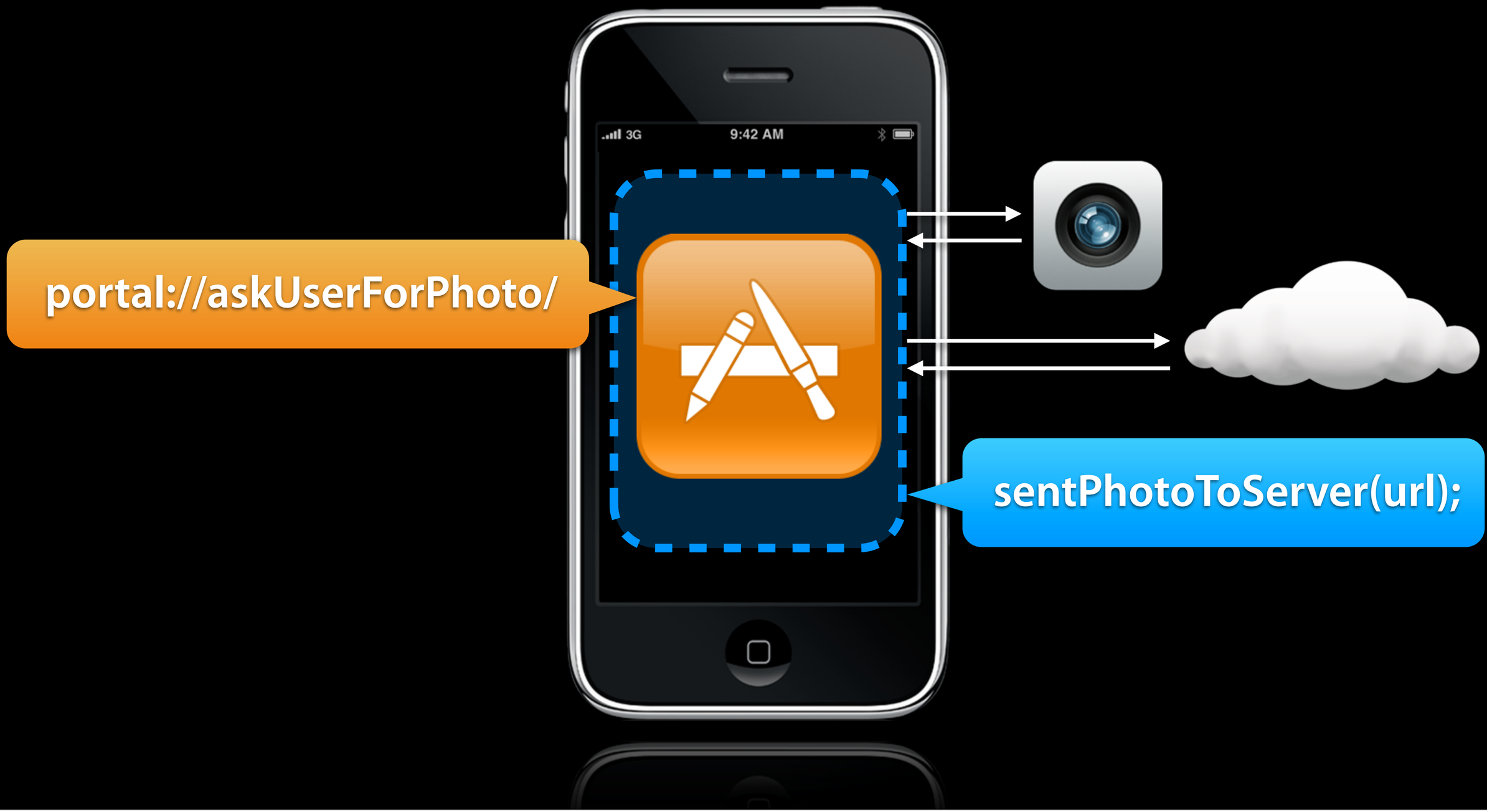
A Tale of 3 Platforms

Phone, Mail, Maps	✓	✓	✓
App Icon	✓	✓	✓
Instant Deployment	✓		*
Multi-Touch	✓	✓	✓
Graphics/Animation	✓	✓	✓
Local Persistence	✓	✓	✓
Available Offline	✓	✓	✓
Location Services	✓	✓	✓
Accelerometer		✓	✓
Camera		✓	✓
Push Notification		✓	✓

The Invisible Man

The Invisible Man

The Invisible Man



The Invisible Man

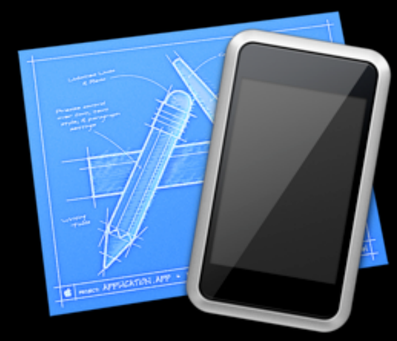
Metamorphosis

In-House App Development for iPhone

Jake Logan
Sr. Software Engineer, Enterprise Technology Services
Apple IS&T

Best Practices: Architecture and Development

1. iPhone is NOT a desktop
2. Build on existing infrastructure
3. Engineer for performance
4. Test on the device
5. Architect for security
6. Create a hybrid “Portal” platform
7. Customize your deployment plan



iPhone Is Not a Desktop

1

- Different security model
  - Device is personal
  - Each app is sandboxed
- Only one app runs at a time
- Network performance
- Processing power

≠

Don’t Try to “Port” Desktop Apps

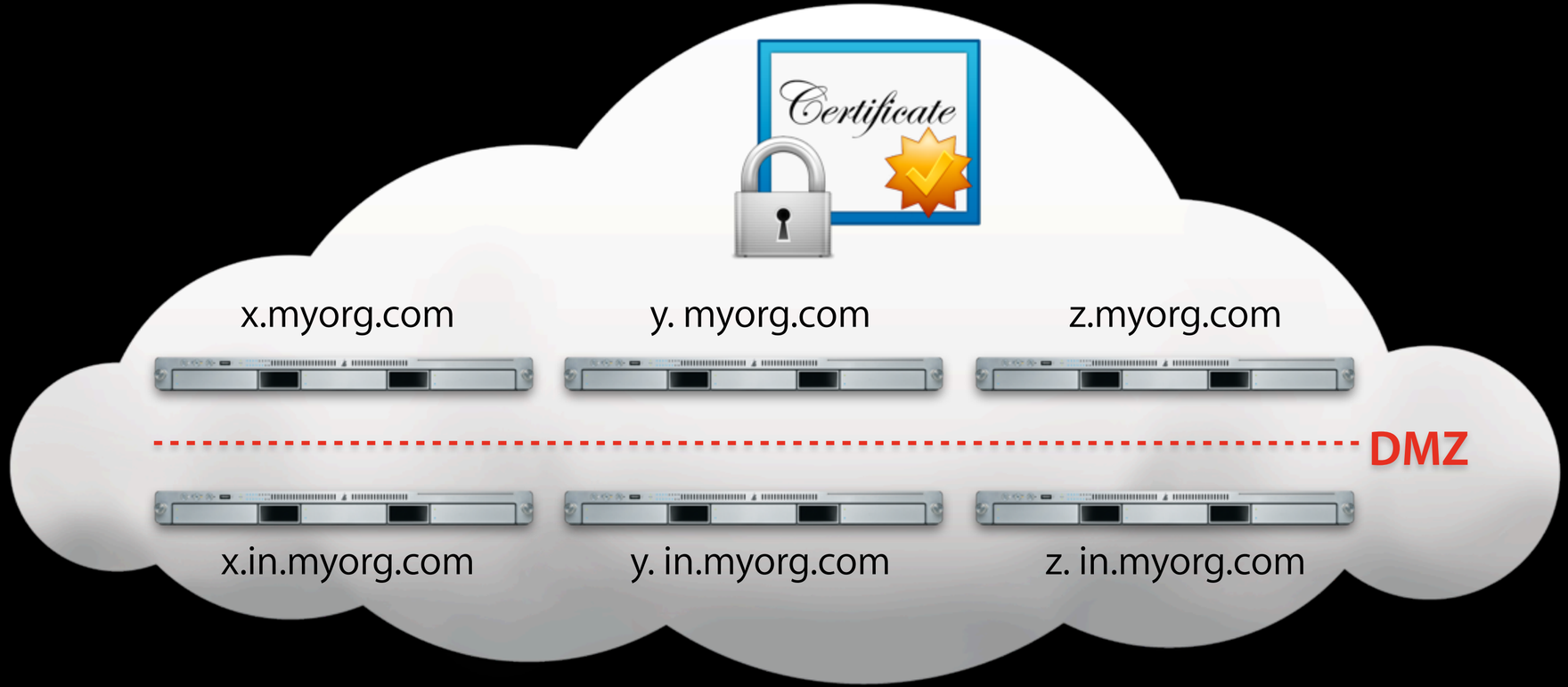
Overcome delta between Cocoa Touch and Desktop

- Build reusable statically linked libraries
- Wrap LDAP with web services

Build on Existing Infrastructure

2

- Leverage existing services and business processes
- Employ stateless SOA architecture for scalability
- Create RESTful wrappers for SOAP/web services



Engineer for Performance

3

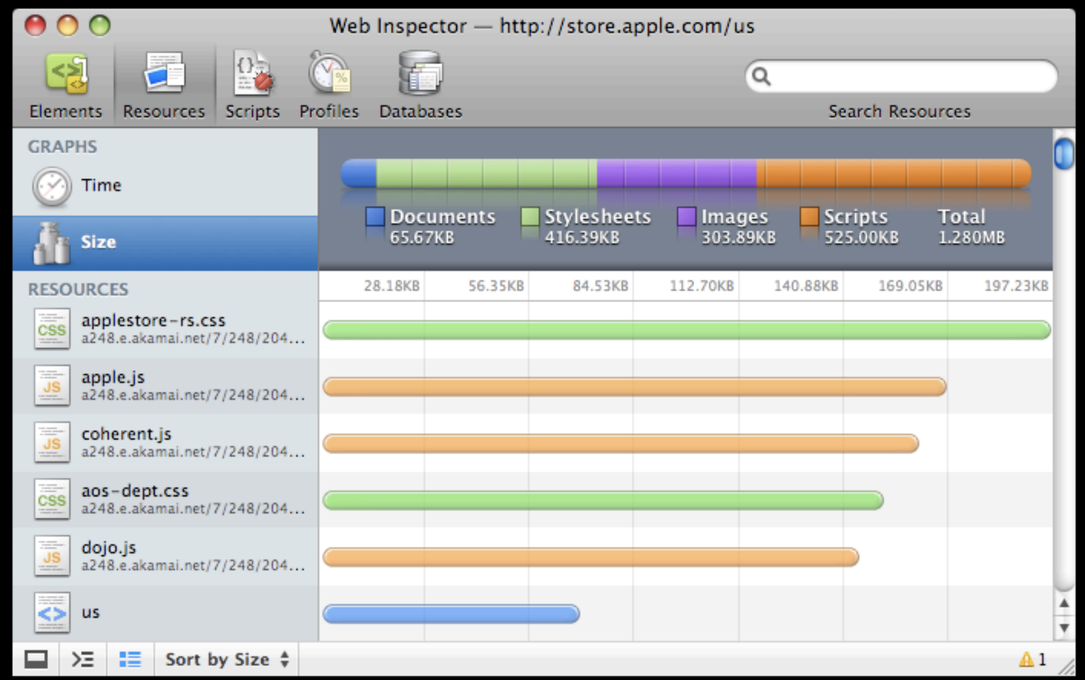
- Minimize service invocations
- Construct mobile-optimized wrappers
- Test with 3G/Wi-Fi turned off
- Take advantage of caching mechanisms

Shrink Response Times

- Capture timings in client and server
- Evaluate timing data and identify hotspots
- Tune client and server appropriately
- Rinse and repeat

Reduce Size and Number of Resources

- Use the Safari Web Inspector to gauge app footprint
- Combine textual resources
  - JS, CSS, XML, JSON, etc.
- Combine image resources
  - Employ spriting technique
  - Optimize image file size
- Turn on server compression



Test on the Device

4

- Use the Simulator to rapidly debug
- Be aware of Simulator differences
  - Security.framework
  - Network performance
  - Processing power

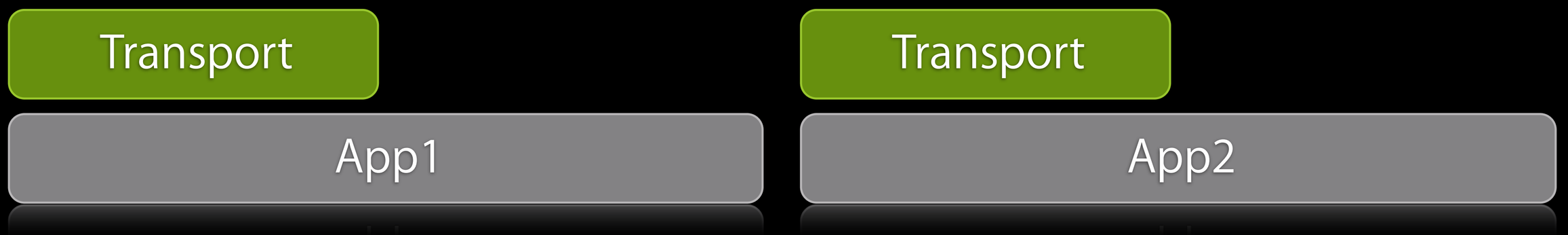
Architect for Security

5

- Always use SSL
- Implement secondary encryption on passwords
- Use the Keychain to persist sensitive data

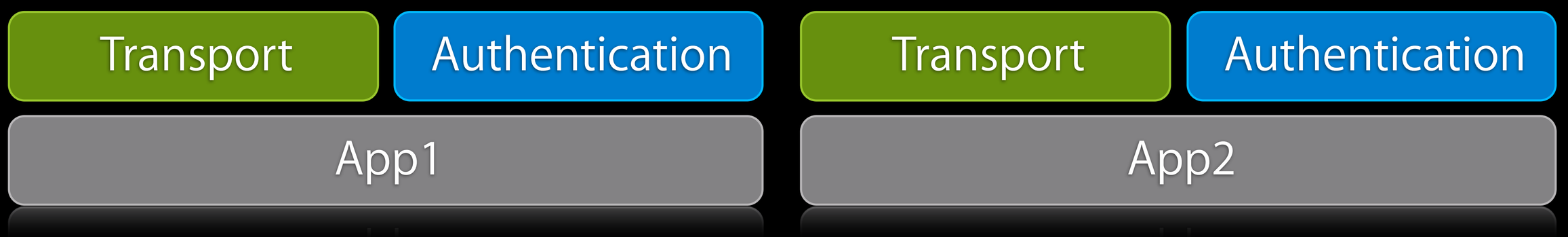
Create a Secure Transport Library

- Implement as an Xcode static library project
- Wrap NSURLConnection and enable SSL
- Leverage in-built NSDictionary parsing to reduce code



Create a Shared Authentication Library

- Support multi-app single sign-on (authentication)
- Control access to apps (authorization)
- Implement Keychain slice sharing



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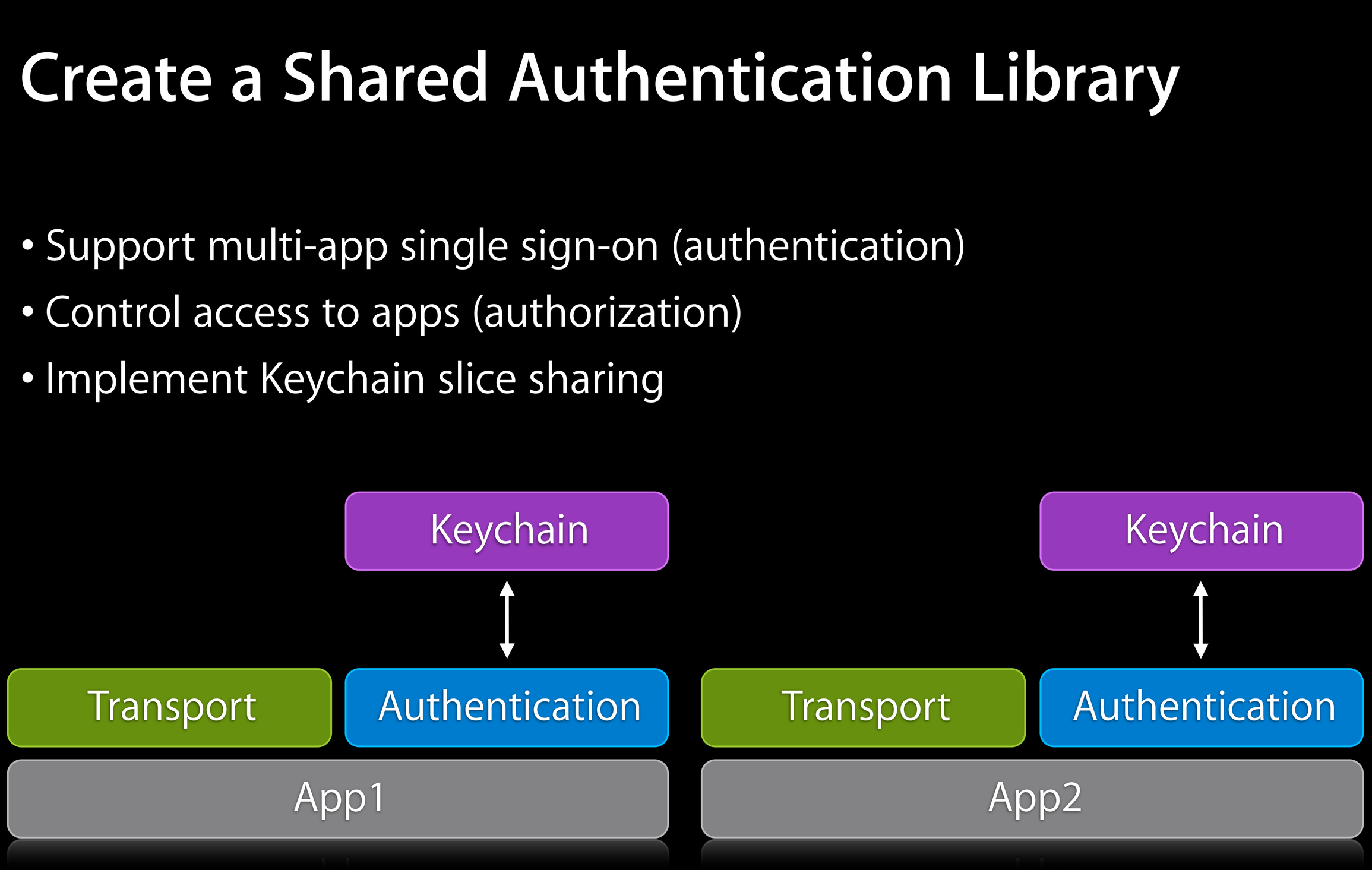

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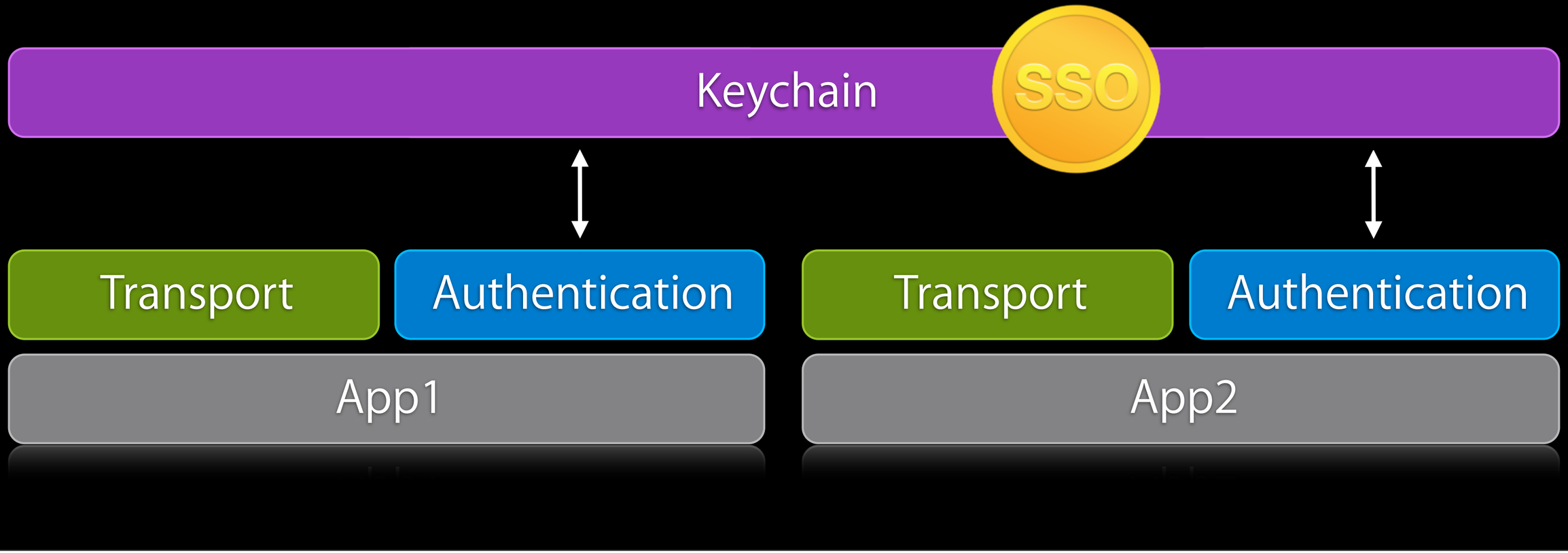


How to Set up Keychain Slice Sharing

- Create a wild-card app ID in the Program Portal

```
A1B2C3D4E5.com.mycompany.*
```

- Add a Keychain access group name to Entitlements.plist

```
<key>keychain-access-groups</key>
<array>
     <string>A1B2C3D4E5.com.mycompany.MyGroup</string>
</array>
```

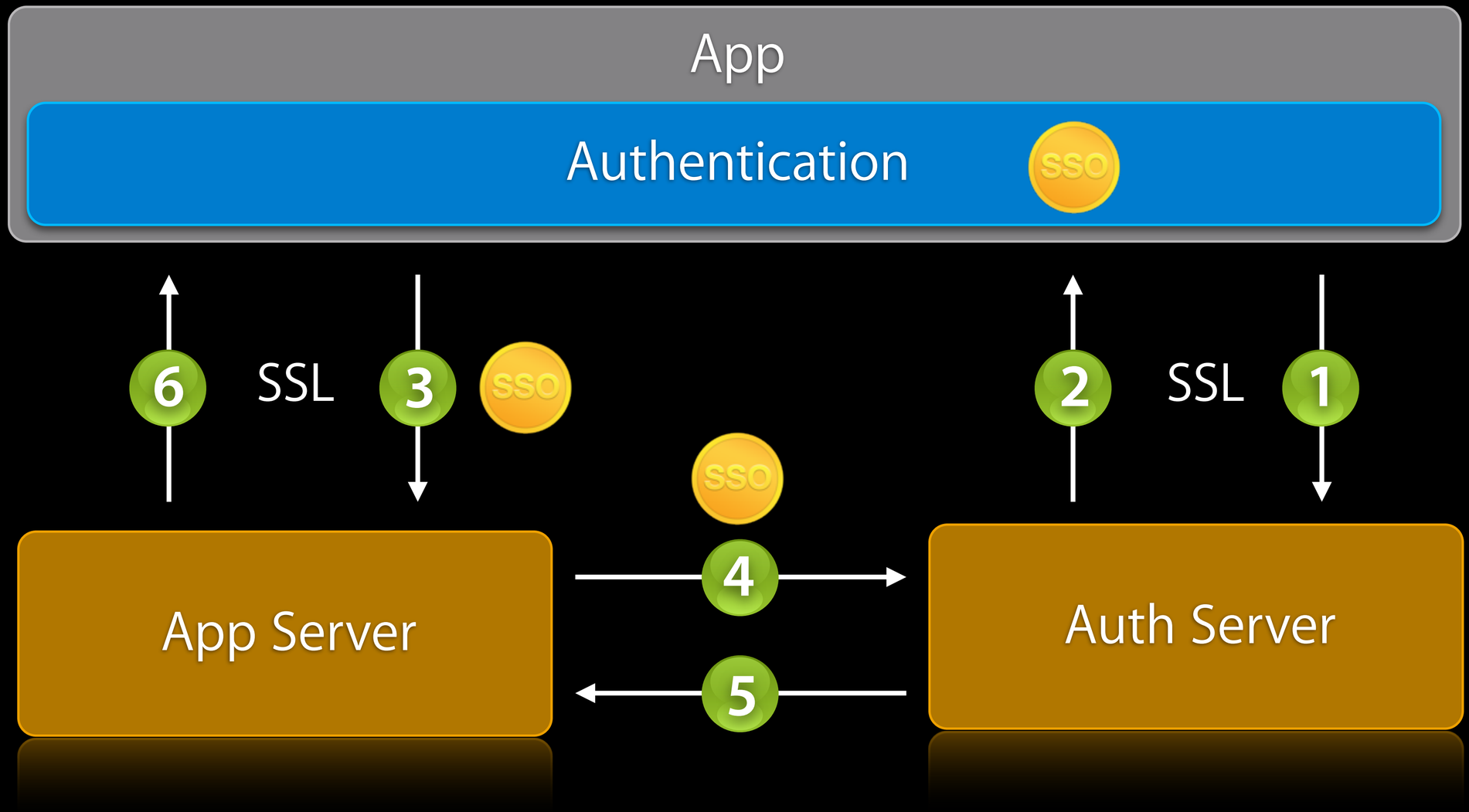
- Access your shared Keychain slice with the access group name

```
NSMutableDictionary* dict = [NSMutableDictionary dictionaryWithCapacity:2];
[dict setObject:(id)tokenStr forKey:(id)kSecAttrGeneric];
[dict setObject:(id)dateRef forKey:(id)kSecAttrCreationDate];

[dict setObject:@”A1B2C3D4E5.com.mycompany.MyGroup” forKey:(id)kSecAttrAccessGroup];

OSStatus status = SecItemAdd((CFDictionaryRef)dict,NULL);
```

Ensure Mutual Authentication

- Prevent man-in-the-middle attacks
- Client must authenticate server
- Server must authenticate client

Implement Token Verification

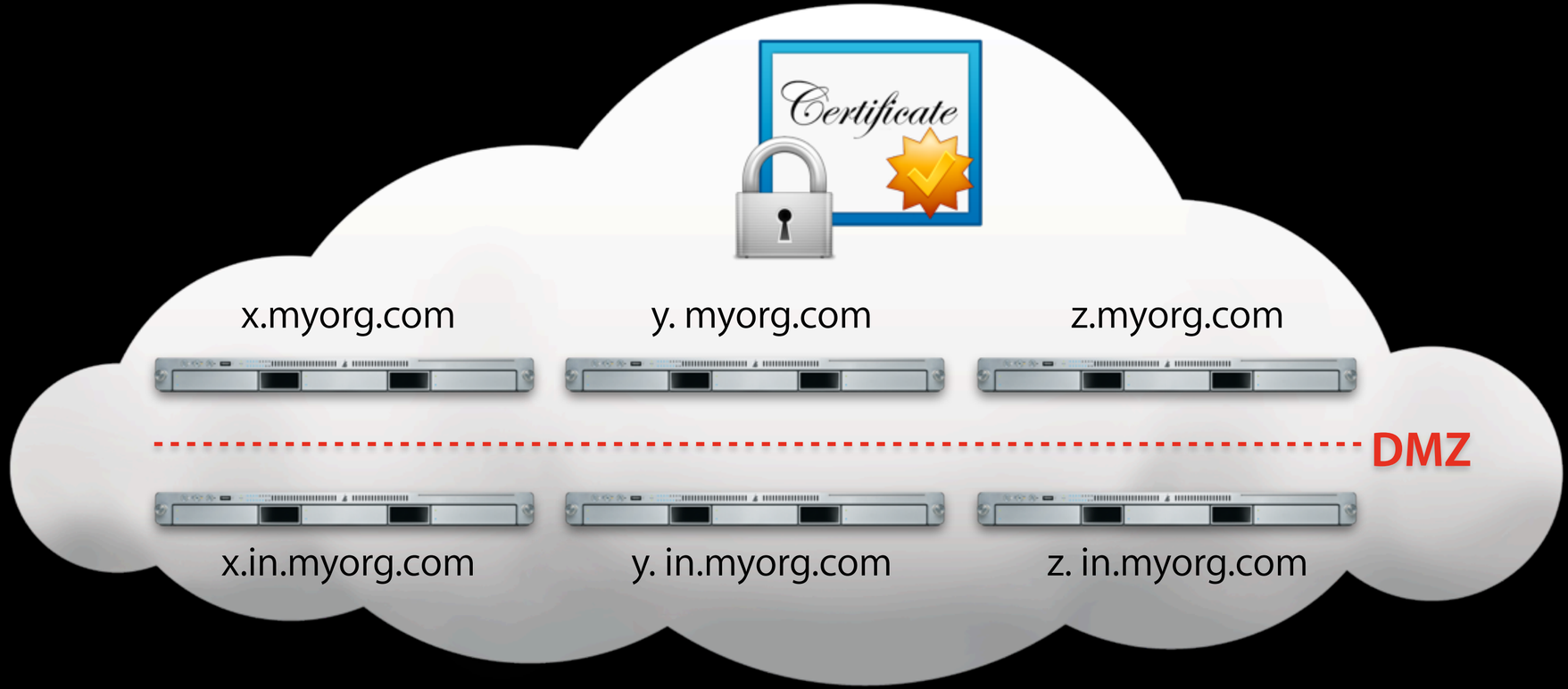


Create a Hybrid "Portal" Platform

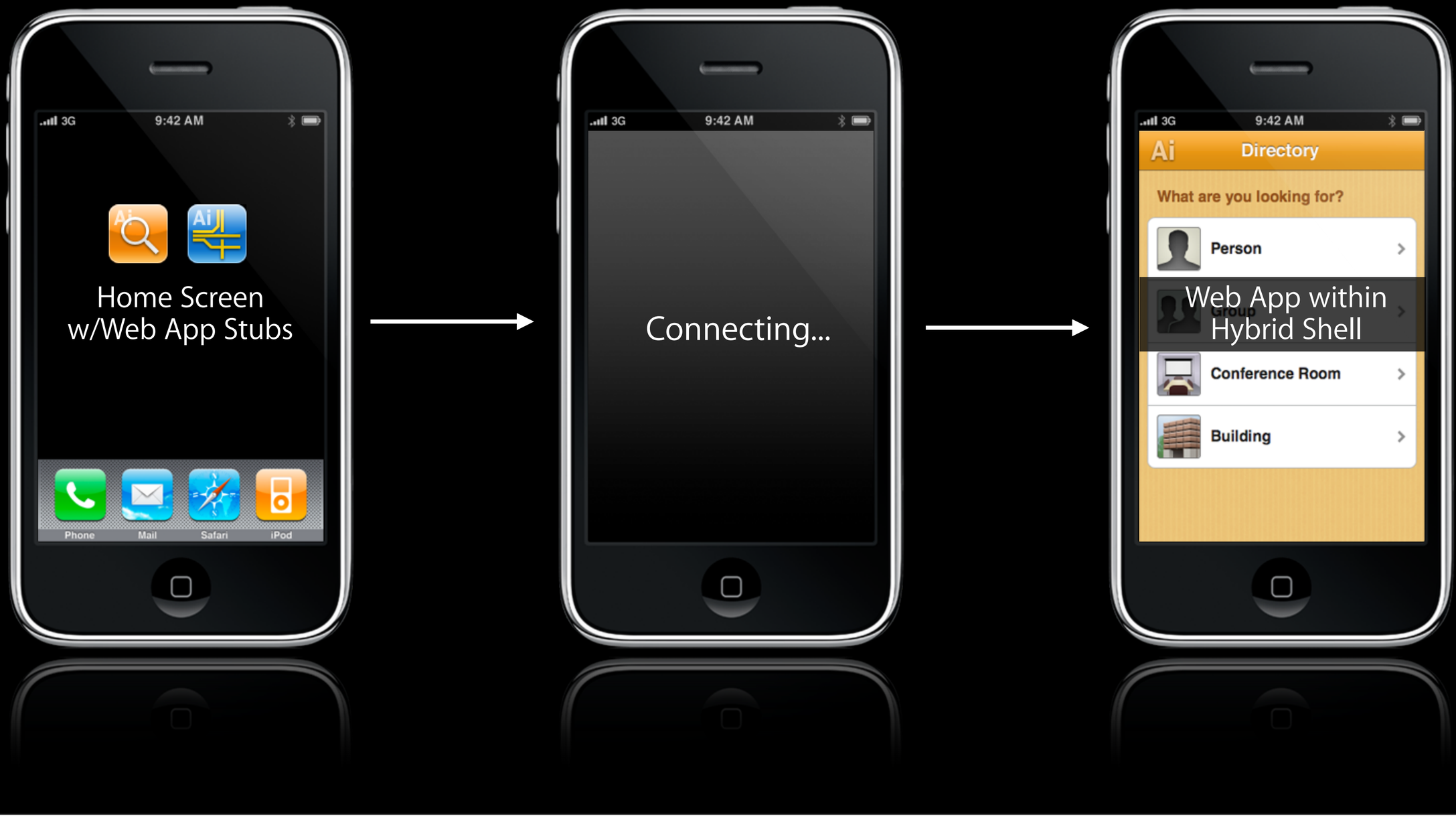
- Implement authentication centrally
- Create stubs to launch web apps within the Portal
- Access native APIs from JavaScript
- Blur the lines between native and web apps

Secure “Cloud” Architecture

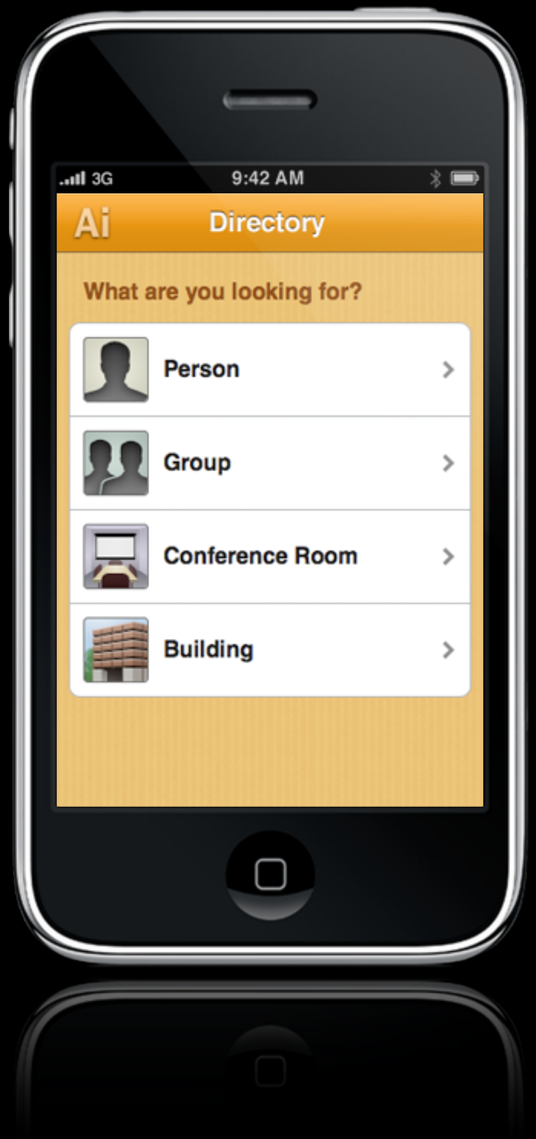
- Secure external data access via SSL
- No VPN token needed



Portal Client Architecture



Portal Client Architecture



App Server 1

App Server 2

Portal Client Architecture

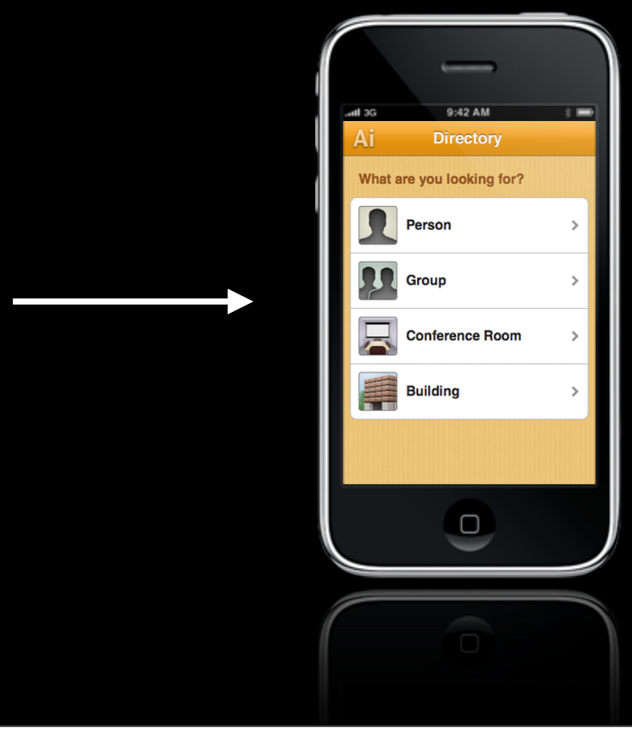
App Server 1

App Server 2

Leverage URL Schemes Across Applications

- Launch your app from any app in iPhone OS
- Enable inter-app messaging
- Use with caution to prevent “buffer overflows”

```
portal://launchwebapp=Dir
```



How to Set up Web App Stubs

- Create a small Xcode Cocoa Touch project
- Launch the web app in applicationDidFinishLaunching():

```
- (void)applicationDidFinishLaunching:(UIApplication *)application {
    NSURL *url = [NSURL URLWithString:@”portal://launchwebapp=Dir”];
    [[UIApplication sharedApplication] openURL:url];
    [window makeKeyAndVisible];
}
```

- There is no step 3!

Demo

Hybrid Portal + Web App Stub

Steve Cotterill
User Experience Engineer

Customize Your Deployment Plan

7

- Create a UPP on the Program Portal
- Use the UPP to sign your apps with Xcode
- Create a website to host the UPP and apps
- Install apps with iTunes or IPCU

Option 1

Option 2

Development Ideas

- Directory Services
  - Look up people, groups, places, applications
- Collaborative
  - Approvals
  - Group calendaring
  - Remote access to voicemail
- Organizational news channel
  - Transit tracker
  - Menu service
- VPN on demand (iPhone OS 3.0)

Oh, the Places You'll Go!

- iPhone is not a desktop
- Test on the device
- Engineer for performance
- Architect for security

More Information

Mark Malone
Internet and Server Technologies Evangelist
mmalone@apple.com

Apple Training and Certification
http://training.apple.com

Related Sessions

iPhone User Interface Design	Presidio Tuesday 9:00AM
Integrating iPhone into the Enterprise	Mission Tuesday 9:00AM
iPhone Web Applications from Start to Finish	Russian Hill Tuesday 2:00PM
Apple Push Notification Service	Pacific Heights Tuesday 5:00PM

More Related Sessions

Displaying Web Content in iPhone Applications	Marina Wednesday 9:00AM
Deploying Mobile Access Server	Russian Hill Wednesday 2:00PM
iPhone Security Best Practices	Mission Wednesday 5:00PM
Managing the iPhone Development Process	Russian Hill Thursday 10:30AM
Optimizing Performance on iPhone	Pacific Heights Thursday 10:30AM
iPhone Configuration Creation and Deployment	Pacific Heights Thursday 3:30PM
Local Data Storage and Offline Web Applications for Safari	Russian Hill Thursday 3:30PM

Q&A

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